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ABSTRACT

Beginning with a clarification of the difference between the product and the process approach to audiovisual (educational) technology, a series of levels or categories of media use are presented: (1) the tool level; (2) the data level; (3) the behavior control level; (4) the meaning level; (5) the research level; and (6) the systems level. Using this orientation, four major trends are discussed in detail: (1) increasing availability and use of media; (2) better information about media; (3) greater concern for the individual; and (4) increasing sophistication with media. The context for the entire presentation is schools and libraries. (Author)

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Current Trends in AV Technology

Donald P. Ely

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Current Trends in AV Technology

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It is an appropriate exercise for professionals to take stock of their field from time to time. However, the best time to conduct such an inquiry is not as clear as the fact that it ought to be done. A formal request from a conference chairperson is an appropriate stimulus and therefore I shall put my finger to the wind and attempt to discern the direction of the movement.

It would be easy to equivocate by paraphrasing Dickens: "It is the best of times, it is the worst of times; it is the age of wisdom, it is the age of foolishness." This is a time when new technological developments offer unprecedented opportunities for creating and using information and yet, at the same time, the potential loss or control of personal freedom by the same technologies which can help us, is a spectre we must consider. The application of technological tools to solve communication problems has, at the same time, generated a host of new problems. Today is an age of wisdom and an age of foolishness. In attempting to identify and describe the trends in educational technology, I will emphasize the best that I know but I will also point out the dangers.

This presentation will first analyze the definitions of the field we are discussing and then present several basic premises regarding the use of technology in education. From this orientation, four major trends will be discussed: (1) increasing availability and use of media; (2) better information about media; (3) greater concern for the individual; and (4) increasing sophistication about media.

Prepared for presentation at the 19th Biennial Conference of the Library Association of Australia, Hobart, Tasmania, August 30, 1977.

Definitions

It may be presumptuous of me to interpret the title of the topic which was given to this session ("Current Trends in AV Technology") but I would like to clarify what might cause confusion later on.

When the term, "AV technology" is used I assume that the dominate meaning for most people would refer to the "things" or products of our technological society - the "hardware" and "software;" the machines and media; the equipment and materials. That interpretation is indeed so widespread that the Presidential Commission on Instructional Technology (1970) in the United States offered it as a commonly held definition:

> "... the media born of the communications revolution which can be used for instructional purposes alongside the teacher, textbook, and blackboard .... television, films, overhead projectors, computers, and the other items of 'hardware' and 'software' ..."

I would like to dissuade you from that definition and offer in its place the <u>second</u> definition, much less known and accepted, which the same Commission offered:

> (Instructional technology) is a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and nonhuman resources to bring about more effective instruction.

As you ponder this definition, you will note that the <u>process</u> of instructional technology is emphasized rather than the products. AV technology (or <u>media</u> as I prefer) is a subset of the larger process definition. The process definition is the first and probably the most important trend. It provides a <u>context</u> in which the media play an integral role rather than to set aside the media as separate entities. In the process definition the media become part of a systematic design to deliver

information to users. Mere delivery of information in whatever format is insufficient until a conscious statement of the user's purposes and analysis of the audience who will receive the information is made. It must be remembered throughout this presentation that the process definition undergirds all that is said. To consider media qua media is to look at solutions in search of problems.

It is easy to become caught up in the glamour of the media without realizing that they exist as a means of communication. A favorite game among media-oriented people is to analyze such new devices as videodiscs, cable television, satellite transmission and minicomputers in terms of possible applications rather than to consider the communication problems which need to be solved. This logic carried to the extreme creates delivery systems in search of users and content to communicate.

Finn (1966) provided a construct for considering the use of media. He named six categories or levels for media use which help us to understand the role which media play in different contexts.

1. The tool level
2. The data level
3. The behavior control level
4. The meaning level
5. The research level
6. The systems level

The Tool Level

The tool level is defined as providing the user with devices and materials which may permit a person to do better what is already being done

in another way. For example, writing on transparent plastic or using a prepared written transparency on an overhead projector is more efficient than using a chalk-board; using a simple single camera closed circuit TV system to amplify a demonstration permits more individuals to see what would normally be too small for a large group to observe. At the tool level, the control is in the hands of the user and the materials are generally created for this one purpose.

The Data Level

This category signifies that information can be stored in a variety of formats. Data may originally be recorded on or transferred to various forms of photographic or magnetic storage. Microforms, computer tapes, videotapes, motion pictures, audiotapes and still pictures are examples of media used in this manner. Such sources of information require new concepts regarding the library's role. New forms of storage, retrieval and delivery are now required.

The Behavior Control Level

Although the word, "control" is anathema to many, it is used here in the sense of programing information for teaching and learning. Finn says: "It is characteristic of all such programing that great energy is spent on a prior basis encoding the content into some form of program designed either to shape the behavior (mainly verbal) of the student on a controlled basis or to lead the student through carefully planned sequences of subject matter, branched or unbranched." These programs may be delivered through a computer, a slide/tape, an 8mm film and the like. The programing is done before the user comes into contact with the medium.

The Meaning Level

The meaning level describes the application of media for the purpose of reducing abstraction. In a simple example, a motion picture showing a distant land or the metamorphasis of a butterfly provides meaning for an abstraction which would be difficult to provide accurately in any other way. Some people feel that such "simplification" becomes less and less necessary as the individual matures and is better able to handle abstract concepts. The weakness of this assumption is that all people are equally able to interpret verbal symbols. The fact is that there are variations in the way individuals perceive information and each person has different preferences for acquiring information. (DiVesta,1975). Some individuals learn better through pictorial stimuli, others through audio and still others through printed verbal symbols. Combinations of stimuli are probably best and they will vary depending upon the purposes and learning style of the individual.

The Research Level

The research level complements the data level. Here individuals use media as instruments to record data for later observation and analysis. Audiotape is used by anthropologists to record language dialects. High speed movement is recorded on motion picture film to study in detail when projected at the normal rate. Still photographs are taken by architects to preserve details of buildings. There are many more examples, but the point is that media are used to record and measure for the purpose of research. These recordings could then be placed in a library and thereby be made available at the data level.

The Systems Level

In areas of instruction and training, the systematic approach to instructional design has demanded a wide range of media -- books, films, slide/tapes, tests, etc. to achieve specified objectives. In this case, all elements of the process are analyzed and specifications for each are spelled out: content, objectives, entering behavior of learners, time available, locale of use, grouping of learners and evaluation procedures before media and strategies for their use are determined. Entire courses and curricula have been developed at the systems level. An excellent example is the British Open University. (Northcutt, 1976). It is at the systems level that the full implications of the second definition of instructional technology become apparent.

A Basic Premise

At the present time we have a comprehensive catalog of media which will permit users to achieve virtually any purpose. The six "levels" of media use offer a model for using all these media to accomplish specific objectives. We no longer have to wait for new inventions; for improvements of the current devices and materials or for more favorable economic conditions. The essential questions are: (1) How can we use the media creatively? (2) With whom can the media be used? and (3) For what purposes can each medium be used most effectively and efficiently?

The problem is not how to store information. (Should we use 8mm film, 16mm film or videotape? Should we use microfilm or microfiche?)

The problem is not how to deliver information. (Should we use closed circuit TV, broadcast TV, reel to reel videotape, video cassettes, cable TV or satellite transmission?)

The problem is how to provide a plurality of means which can serve the user's purposes in the most cost effective manner. If we can accept this assumption, then we must purge our thinking of media myopia which holds that one medium is superior to another. We must be prepared to embrace the full spectrum of media options which our users require.

Trends

A trend is a statement of direction based on analysis of current events and projecting the findings to the near-future.

We have already considered the trend toward a broader, systematic use of media in a process framework. Let us look at media as one element of the larger context. There appear to be four trends: (1) increasing availability and use of media; (2) better information about media; (3) greater concern for the individual; and (4) increasing sophistication about media.

Increasing Availability and Use of Media

In the United States there are more television sets than indoor toilets. By the time a Northamerican youngster finishes secondary school he has spent more time watching television than in school. The battery-powered transistor radio has changed communications patterns in many developing countries. How many in this audience own a camera? How many own a cassette tape recorder? Do you have a record player in your home? A radio in your car? How many commercial movies have you seen this year? We are living in a media-rich world and each medium carries information - for entertainment, for recording personal data, for learning or whatever. Is there any reason why our libraries and schools should be less concerned with media than the rest of society?

The ubiquitous nature of the media is a result of greatly reduced costs for the devices and carriers of information. Consider: the cost of a hardback book vs. a paperback or a microform; the cost of a camera, cassette tape recorder or a transistor radio today vs. ten years ago; the cost of an overhead projector, TV camera or TV monitor vs. twenty years ago. The increased use of these devices has increased the supply and reduced the unit cost. Much of the reason for the lower costs of equipment is due to the miniaturization of equipment through less costly electronic and mechanical parts. The materials such as film, audiotape and videotape remain about the same despite the general inflationary trend. The message is that media are available and are being used in tremendous quantities by people the world over.

With the increasing availability of media comes the difficulty of choice. For personal leisure a generation ago, a person using a medium could choose a radio program, a book, perhaps an occasional movie or disc recording. (For the moment we will not consider other recreational forms or travel possibilities.) At this time we might say we were experience rich but information poor. The information sources were limited while opportunities for first hand experience around the home and community were abundant. But now, we are information rich and experience poor. We have multifarious sources of information in which we indulge while our first-hand experiences are reduced.

Beyond the home, we turn to education. Teachers and students a generation ago depended upon the knowledge of the teacher and the content of the textbook as primary resources. The teacher was the information giver

while the textbook served as a supplement. From time to time, the chalkboard, maps and real objects served as teaching aids. But now, there is a vast arsenal of resources which provide information in a variety of formats. The teacher's role has changed to that of a diagnostician and coordinator of learning resources. The dilemma seems to be which resources to use for what purposes with which students.

The adult learner who wanted to continue his or her education a generation ago had few, if any, places to turn. Today, opportunities are available on nights, weekends, during holidays, by television or radio, by correspondence and through combinations of these procedures. Updating and upgrading training occurs on-the-job in the office, shop or training center. This training is accomplished largely through media. We are in an era of lifelong learning and media provides a pluralistic approach to meet the multiple styles and preferences of adult learners.

In this milieu, where is the library?

Better Information About Media

Without any information about bibliographic control of audiovisual (nonprint) media in Australia, it is difficult to be specific about trends which might be helpful but there are several international efforts and examples in the United States which might provide indicators.

The International Federation of Library Associations (IFLA) is in the final stage of developing cataloging standards for the International Standard Bibliographic Description for Non-Book Media (ISBD:NBM). Meanwhile, the revision of Chapter 12 of the Anglo-American Cataloguing Rules serves as a useful set of guidelines. The Statistics and Standardization Committee

of IFLA has developed guidelines for counting non-book media. The International Standards Organization (ISO) is in the early stages of developing non-book media standards.

In the United States, the National Information Center on Educational Media (NICEM) serves as the most comprehensive data base of non-book media. It regularly publishes descriptive (but not evaluative) catalogs and updates for 8mm films, 16mm films, videotapes, recordings, transparencies, filmstrips and slide sets. A more comprehensive data base of 16mm films is being developed by the R.R. Bowker Co. for the Consortium of University Film Centers.

While bibliographic control is important, the evaluative element is missing. To my knowledge, there is no international effort to evaluate audiovisual media. In the United States, there is a new data base, the National Instructional Materials Information System (NIMIS), which specializes in all types of instructional materials for handicapped learners. The present data base of approximately 25,000 items includes evaluative information. The Educational Products Information Exchange (EPIE) evaluates materials in specialized fields such as career education, vocational education and special education. There are journals, such as Previews, which regularly evaluate audiovisual media.

All of these bibliographic and evaluation attempts are still crude and incomplete in concept and operation but they offer a beginning. They will continue to grow, and perhaps to combine and, eventually may provide a data base for international use.

Greater Concern for the Individual

For the first time in history we can offer a variety of information formats which are geared to the individual. The paradox of this era of the mass, is that it also is the age of the individual. We hear the lonely voice in the crowd saying, "I am an individual. I am unique. I am me. Let me control my own destiny. Free me to seek that knowledge which will be useful to me." This is clearly an age when the most important number is one.

The most important number is one. This premise has spawned one of the most important new developments in education and libraries today - individualized instruction. A generation ago education was asked to provide "the greatest good for the greatest number." Today we try to provide "the best for each." For decades educators have talked about individual differences without much difference being displayed in classroom practice. But now ... the increased availability of media in a wide variety of formats has opened new potentials never before possible.

Why individualization? Why the best for each? Why is "one" the most important number? Because each person has the right to pursue life, liberty and happiness to the fullest extent possible. To achieve personal uniqueness in this pursuit, teachers and learners must first take charge of their own lives and develop them to the fullest. It means that each individual should be able to run his or her own life and not have it run by others. The complete individual is one who has his own sense of power, his own uniqueness, his own sense of indispensability. If a person fails to develop his or her individuality he or she will become

either apathetic or rebellious. Apathetic persons accomplish nothing. People who believe in nothing change nothing. Rebellious persons may bring about visible but superficial changes. Neither state is desirable.

The use of technology can increase the number of information alternatives available. The pluralism of our age is marked by a pluralism of means. This pluralism permits a range of media formats to be considered in meeting the information needs of each individual.

Increasing Sophistication About Media

As media become more pervasive in our society, there arises a concomitant need to help individuals understand how to critically use the media. The drive toward literacy in our schools and with adult populations is not paralleled by a concern for "media literacy." We need to help people interpret and use television, films, radio, advertising and other media which offer daily sources of information. In the United States, there is a movement designed as visual literacy.

The concept of what is now known as visual literacy evolved from an approach to education involving multi-sensory, multi-disciplinary, flexible and realistic methods and goals. With the appearance of vast amounts of materials has come a renewed emphasis on the value of and need for a more visual approach to learning. It is doubtful that the concept of visual literacy is an innovation; rather, it probably describes phenomena that have been successful in the past ... the media and modalities used by the teacher have changed or have been adapted by time and progress.

What is the visual literacy concept? A complete and somewhat esoteric definition has been developed by the National Conference on Visual Literacy:

> Visual literacy refers to a group of vision-competencies a human being can develop by seeing, and at the same time, having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret visible actions, objects and/or symbols, natural or man-made that he encounters in the environment. Through creative use of these competencies, he is able to communicate with others. Through appreciative use of these competencies, he is able to comprehend and enjoy the master works of visual communication.

Visual Literacy in Education

Ours is an age of mass media. We are a mobile, sophisticated and volatile society. For the pre-school child who has grown up with television, a visual approach to learning has already been deeply ingrained by the time he/she enters school. School programs have no easy task in the early years to provide an exciting and alive an environment as the children meet on television. And yet, if educators are to effect change, they must begin in the early grades -- to avoid having school life becoming irrelevant to "living."

How is the visual literacy concept integrated into the school curriculum as either an additional set of learning activities for those students already achieving or as another approach to educate those students unable or not willing to learn verbally -- or for whom the traditional program is inadequate or ineffective? Can the non-readers be reached through a non-verbal methodology? Although no one method or set of materials will work for 100% of the children, there is usually some method that will bring success for most children.

Here is an outline of a typical "visual literacy" project designed to approach the problem of reading and visual-verbal communication with a

group of elementary students. They are provided with easily operated cameras and film and, after a brief discussion of the mechanics of picture taking, are sent out to take pictures. Since one of the goals is to use the camera as a tool for developing a new form of self-expression, no subjects are suggested or themes given for the students. The pictures shot are solely of the student's own choosing. However, in most cases a theme will appear. For some, their friends will fill their pictures; for others, only inanimate objects will be included. These photographs are visual statements by the children of things that are important to them. They can provide valuable insights into each child's world as he saw and experienced it.

Next, in our typical visual literacy school program, the students are asked to use their cameras to take photo sequences. This time they will be made aware that there is to be a theme and a logical sequencing. Again, much valuable information about the children may be gained. Indications of their awareness of the progression of time, of logical movement from one phase to another, of casual relationships between stimulus and response are some examples of such information. Equally significant will be the themes: some will be social import, others of purely personal value. In most cases, however, the student will reveal some very definite self information. The photographs may be used as bases for group discussions and for points of departure during individual student-teacher conferences.

A natural outgrowth of the still photography project will be the use of the moving picture camera and its almost limitless possibilities. Then on to closed circuit videotape equipment with its obvious advantage of

instant playback. The act of producing a finished product in each case -- photographs, movie, a videotape -- is in itself an accomplishment and direct positive reinforcement for the students. The introduction to new skills and a new mode of self-expression, and the feelings of personal worth gained from sharing and discussing their work with peers, parents and teachers will all affect student attitude toward the use of verbal language and, in fact, changes in fluency in the language may be detected.

While this example is from the schools, analagous examples in libraries could be drawn.

Conclusion

These, then are the trends - trends in media technology which are shaping the world in which we live. To some it may be frightening and perceived as potentially dehumanizing. To those with such concerns, consider the Wizard of Oz:

> "I don't know enough," replied the Scarecrow cheerfully. "My head is stuffed with straw, you know, and that is why I am going to Oz to ask for some brains."
>
> "Oh, I see," said the Tin Woodsman. "But, after all, brains are not the best things in the world."
>
> "Have you any?" inquired the Scarecrow.
>
> "No, my head is quite empty," answered the Woodsman, "but once I had brains, and a heart also; so, having tried them both, I should much rather have a heart."

To others, this is an age of opportunity when, for the first time in human history, we have the resources to communicate with virtually any person, anywhere in the world.

I started by saying, "It is the best of times, it is the worst of times. It is the age of wisdom; it is the age of foolishness. It is out of such times that brave people forge their victories.

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